PD-ABT-941

THE
CARTER CENTER

August 21, 2001

Emmanuel E. Atsalinos
Grant Officer
M/OP/A/HRN
U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523

Subject: **Final Narrative Report on Grant HRN-G-00-99-00025-00, Guinea Worm Eradication**

Dear Mr. Atsalinos,

I am pleased to enclose The Carter Center's final narrative report for Grant No. HRN-G-00-99-00025-00 for the Global Guinea Worm Eradication Campaign, as well as a copy of the financial report submitted under separate cover by Matthew Cirillo to Dennis Carroll on August 2, 2001. The report summarizes past progress and assesses what remains to be done. While we are not yet able to report that we have eliminated Guinea worm everywhere outside of Sudan, we will be able to do so very soon.

As you know, simple preventive techniques employed by communities, such as straining water with a special cloth filter or providing clean water through borehole wells, combined with health education and technical support by resident advisors and village-based volunteers, have reduced the number of Guinea worm cases by 98 percent. Significant progress was made in 2000 and so far in 2001. At the end of 2000, less than 21,000 cases of Guinea worm occurred outside of Sudan, a 34 percent reduction since 1999. With 54,000—or 73 percent—of the world's cases in 2000, Sudan will be the final challenge. The two most endemic countries after Sudan—Nigeria and Ghana—have reduced the number of indigenous cases by 30 and 47 percent respectively for January through May 2001 compared to the same period in 2000.

One of the highlights of the campaign is this year's successful effort to distribute 9 million pipe filters--one for every man, woman, and child at risk of Guinea worm disease in Sudan. The straw-like pipe filters are worn around the neck for ease of use to filter Guinea worm larvae from drinking water. People can now filter their water even if they are displaced by the ongoing civil war. We expect that the increased availability of filters during this year's transmission season will result in significant case reductions by this time next year.

ONE COPENHILL • 453 FREEDOM PARKWAY • ATLANTA, GEORGIA 30307 • (404) 420-5109 • FAX (404) 688-1701

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This progress would not have been possible without USAID's support, which helped to leverage grants from other donors, including support from the Bill & Melinda Gates Foundation. The Gates grant will make eradication possible outside of Sudan in the next one to two years.

Let me also take this opportunity to tell you that I will be leaving The Carter Center on August 28 to study political science at the University of Michigan. Nicole Kruse, who served previously as Interim Vice President for Development and Director of Corporate and Foundation Relations at the CDC Foundation, will join the Center staff as Chief Development Officer for Health Programs. You will be able to reach her after September 4 at (404) 420-5132. If you have questions about the narrative report in the meantime, please contact Craig Withers, Director of Program Support, at (404) 420-3851 or cwither@emory.edu.

Sincerely,

Megan Reif
Associate Director of Development
Health Programs

Cc: Dennis Carroll
Irene M. Koek
Kimberly Ball

USAID Development Experience Clearinghouse
Attn: Document Acquisitions
1611 Kent Street, Suite 200
Arlington, VA 22209-2111
Email: docsubmit@dec.cdie.org

Matt Cirillo

Enclosure

B

USAID GN Grant File (REPORT)

FINANCIAL STATUS REPORT

(Short Form)

(Follow instructions on the back)

1. Federal Agency and Organizational Element to Which Report is Submitted	2. Federal Grant or Other Identifying Number Assigned By Federal Agency	OMB Approval No.	Page	of
U.S. Agency for International Development	Award # HRN-G-00-99-00-00025-00	0348-0039	1	1 pages

3. Recipient Organization (Name and complete address, including ZIP code)

The Carter Center
One Copenhill, 453 Freedom Parkway
Atlanta, Georgia 30307

4. Employer Identification Number	5. Recipient Account Number or Identifying Number	6. Final Report	7. Basis
58-1454716	Account # Project # UG378.384	☒ Yes ☐ No	☐ Cash ☒ Accrual

8. Funding/Grant Period (See Instructions) (Month, Day, Year) From:	To:	9. Period Covered by this Report (Month, Day, Year) From:	To:
9/30/1999	9/27/2001	4/1/2001	6/30/2001

10: Transactions:	I. Previously Reported	II. This Period	III. Cummulative
a. Total outlays	9,259,693	3,245,410	12,505,103
b. Recipient share of outlays	7,977,503	3,227,600	11,205,103
c. Federal share of outlays	1,282,190	17,810	1,300,000
d. Total unliquidated obligations			
e. Recipient share of unliquidated obligations			
f. Federal share of unliquidated obligations			
g. Total Federal Share (Sum of lines c and f)			1,300,000
h. Total Federal funds authorized for this funding period			1,300,000
i. Unobligated balance of Federal funds (Line h minus line g)			-

11. Indirect Expense	a. Type of Rate (Place "X" in appropriate box)				
	☒ Provisional	☐ Predetermined	☐ Final	☐ Fixed	
	b. Rate	c. Base	d. Total Amount	e. Federal Share	
	18.700%	15,005	2,806	2,806	

12. Remarks: *Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation.*

13. Certification: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays and unliquidated obligations are for the purposes set forth in the award documents.

Typed or Printed Name and Title	Telephone (Area code, number and extension)
Iris D. Frank, Director of Finance	(404) 420-5153
Signature of Authorized Certifying Official: Iris Frank	Date Report Submitted: 7/27/01

NSN 7540-01-218-4387 269-201 Standard Form 269A (REV 4-88)

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Global 2000

GUINEA WORM ERADICATION PROGRAM

January 2000-June 2001 REPORT

"The Guinea worm program has given hope to people without hope. Our goal is to eradicate the disease so that for the next generation, the only Guinea worms they will see will be in their text books."

– Dr. Donald Hopkins, associate executive director of health programs at The Carter Center

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Global 2000
GUINEA WORM ERADICATION PROGRAM

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Issues of ***Guinea Worm Wrap-Up*** *with Graphics*

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Background

Dracunculiasis, commonly known as Guinea worm disease, will soon become the second disease—smallpox was the first—to be eradicated globally. This 3,000-year-old parasitic disease rarely makes headlines, but is so painful and debilitating that victims are unable to work, attend school, care for children, or harvest their crops. People are incapacitated by Guinea worm for an average of two and a half months.

At the beginning of the 20th century, Guinea worm disease was widespread in many countries in Africa and Asia. It is estimated that there were about 50 million cases in the 1950s. In 1986, more than 3.2 million people in Africa and Asia were afflicted, and another 120 million were at risk of infection. Victims of the disease are unable to work, attend school, care for children, or harvest their crops during an average period of incapacitation of two and a half months. A study in the late-1980s indicated that Guinea worm disease was causing the yearly loss of an estimated US $20 million by rice farmers in a heavily populated region of southeastern Nigeria alone.

Guinea worm disease is contracted when water contaminated with water fleas carrying infective larvae is ingested. One year later, usually during harvest or planting season, one or more worms up to a meter in length work their way to the surface of the skin forming blisters that cause pain and other symptoms that make productive activity almost impossible. Reinfection can occur if the person again drinks contaminated water, and each infection lasts an average of one year.

The Global Guinea Worm Eradication Campaign had its beginning in 1981, when the Steering Committee of the International Drinking Water Supply and Sanitation Decade adopted Guinea worm eradication as a sub goal of its efforts to provide safe water to unserved populations by the end of the 1980s. At this time, Guinea Worm was known to occur in 16 African countries, plus India, and Pakistan (Yemen was discovered in 1994). Over the next few years, resolutions by the World Health Assembly (1986 and 1991), African Ministers of Health (1988) and UNICEF (1989) followed, confirming the priority of the eradication effort. Many of the technical experts involved in the earlier, successful eradication of smallpox joined the cause and developed a methodology for Guinea worm eradication.

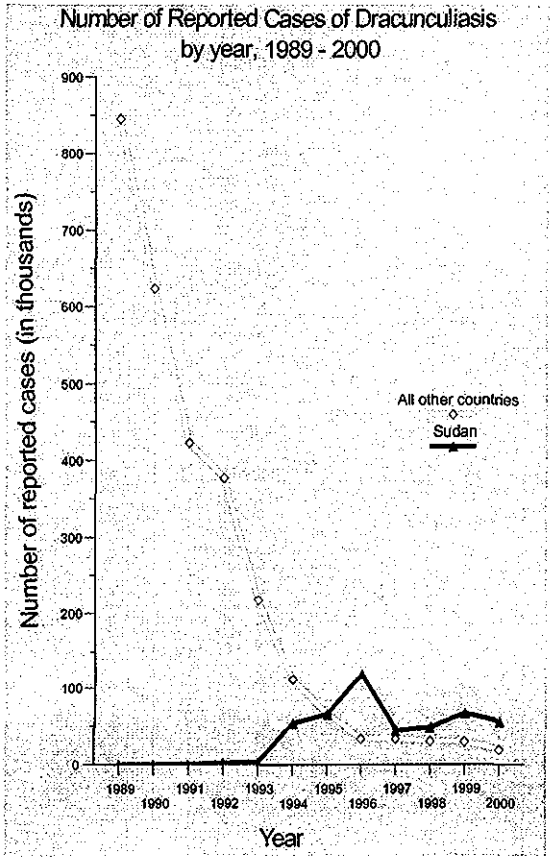
India had established a program in 1983, but there was no organized, global campaign to eradicate Guinea worm disease, even though the Centers for Disease Control and Prevention (CDC) strongly advocated for such an effort. The Carter Center began to support programs in Pakistan and Ghana in 1987 and in Nigeria the following year. The goal was to demonstrate that eradication was possible and to help develop a strategy that the affected countries and international partners could employ in a larger campaign. After achieving some success in these three countries, no other agency had taken the lead and The Carter Center's role continued to expand, working in close cooperation with the CDC.

The Carter Center now leads a global coalition that includes UNICEF, the Centers for Disease Control and Prevention (CDC), and the World Health Organization (WHO). The coalition is working to eradicate Guinea worm and has assisted 20 countries in reducing the annual incidence of cases by 98 percent since 1986. Today, less than 72,000 known cases remain in 13 countries, the majority of which are in Sudan. In 2000, President Carter honored the seven countries that to date have stopped the disease, and cases are disappearing fast in the remaining 13 endemic countries, which will enable Global 2000 to focus increasingly on Sudan. At the end of 2000, less than 72,000 known cases remained, over 73 percent of which were in Sudan. Together, countries outside of Sudan reduced cases by 34 percent in 2000. In order of endemicity, transmission of dracunculiasis now occurs in Sudan, Nigeria, Ghana, Burkina Faso, Niger, Togo, Cote d'Ivoire, Mali, Benin, Mauritania, Uganda, Ethiopia, and Central African Republic.

Eradication Strategy

A pillar of the fight against Guinea worm is the provision of safe drinking water in rural and isolated areas. As a result, the global Guinea Worm Eradication Program (GWEP) is serving as a means to advocate for water supply and sanitation in the poorest and most remote parts of Africa that otherwise would not receive national or international attention because they are not politically important. In this way, GWEP is contributing to a basic development objective that will not only help end this disease, but reduce some other health problems as well.

Education to promote behavioral change associated with family water management and low-technology methods to improve water sources, prevent ingestion, and treat the symptoms of the disease are the most effective means of eradication. The partners employ a strategy consisting of several components to mobilize communities in all countries where the program operates:



1) Health Education: Health workers educate people about the origin of the disease and what they can do to prevent it, including the need to filter all unsafe drinking water and to keep persons with emerging worms from contaminating sources of drinking water. Many approaches, from use of media to house-to-house visits, are used to increase public awareness.

2) Water Treatment: The chemical temephos, donated by BASF Corporation under the brand name ABATE, kills the fleas and is used monthly to treat stagnant pools that are often the sole water source in remote villages.

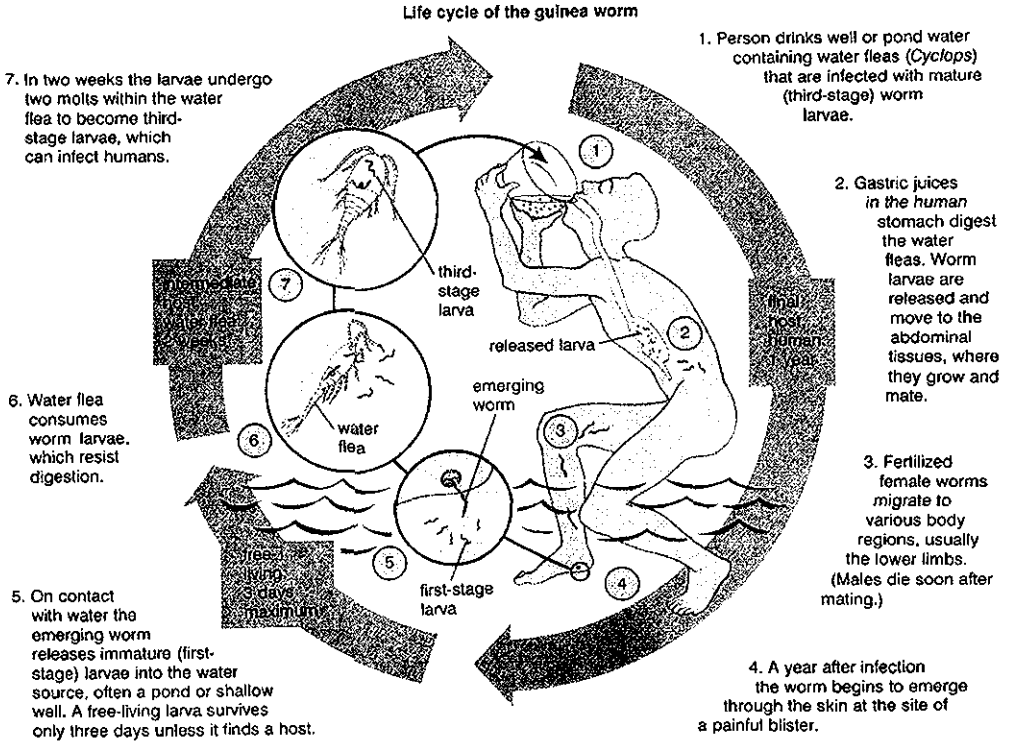
3) Water Filters: Health workers distribute simple cloth and nylon filters to villagers and teach them to strain the Cyclops flea from untreated water.

4) Advocacy for and Provision of Clean Water: President Carter and Center staff advocate for provision of safe water sources (boreholes and hand-dug wells) in endemic areas to national, state, and local authorities and water sector organizations.

5) Case Surveillance and Containment: Health workers attempt to identify all affected villages and to detect each worm before or within 24 hours after it emerges from a victim. Health workers coax emerging worms from victims' blisters and treat the wounds with bandaging, easing the pain so patients will not sooth their infected limbs in the local water supply and repeat the cycle of infestation. They also track the number of cases reported, contained, and other indicators on a to inform program supervisors, the national coordinator, and Global 2000 headquarters. Villages are supplied with bandaging, analgesic, and antiseptic to contain the emerging worms.

Carter Center field staff work in the countries with the heaviest burden of the disease (Sudan, Nigeria, Ghana, Mali, Ethiopia, and Niger), and assist the other endemic countries through short-term

consultancies and small grants. Continued success depends on providing technical and financial assistance to all the endemic countries to improve the effectiveness of interventions against the disease.



Guinea Worm Life Cycle: Guinea worm is contracted when humans consume stagnant water, contaminated with microscopic fleas carrying infective larvae. Inside a human's abdomen, the larvae mature and grow, some as long as three feet. After a year, the worm slowly emerges through a painful blister in the skin. Some worms can take up to two months to be completely expunged. The burning sensation caused by the emerging worm leads many victims to immerse their limbs in water, seeking relief, but the cycle of infection only begins again as the worm releases more larvae into the water.

Health Effects of Guinea Worm: People in remote, rural communities who are most commonly affected by Guinea worm disease do not have access to medical care. Therefore, ulcers may take many weeks (eight weeks average) to heal; often becoming infected with bacteria. This causes disabling complications, such as locked joints or even permanent crippling. Each time a worm emerges, persons may be unable to work or resume daily activities for an average of three months. This usually occurs during planting or harvesting season, resulting in heavy crop losses. Parents who have active Guinea worm disease cannot care for their children.

Summary of Eradication Efforts

National programs in the remaining endemic countries continued their focus on the five basic interventions against the disease, as well as advocacy at the national level to ensure that Guinea worm remains a priority.

A case of Guinea worm disease is contained if all of the following conditions are met:

1. The patient is detected before or within 24 hours of worm emergence; and

2. The patient has not entered any water source since the worm emerged; and

3. The village volunteer has properly managed the case, by cleaning and bandaging until the worm is fully removed, and by giving health education to discourage the patient from contaminating any water source (if two or more emerging worms are present, the case is not contained until the last worm is pulled out); and

4. A supervisor verifies the case within 7 days of worm emergence (to confirm that the case is Guinea worm, and that it has been properly contained).

Program reviews for Sudan, Uganda, and Ethiopia took place in September 2000 in Nairobi, Kenya. Ghana also reviewed its national program in September 2000 and in March 2001. A review of the national programs of Cote d'Ivoire, Benin, Mali, Central African Republic, Mauritania, Niger, Burkina Faso, and Togo took place in October in Niamey, Niger, as part of the review of programs in French-speaking endemic countries. Nigeria reviewed its programs in July 2000. More information about these reviews can be found in the individual country summaries.

On March 26-29, 2001 approximately 200 participants convened in Lome, Togo for the 6th Meeting of National Program Coordinators of Guinea Worm Eradication Campaigns. The meeting allowed participants to gauge the success of their efforts in 2000 and to assess areas for improvement in the coming year. The conference was opened with remarks from Dr. Donald Hopkins, Associate Executive Director of The Carter Center for Global 2000. Dr. Hopkins' remarks stressed the urgency of interrupting the transmission of dracunculiasis in the remaining endemic countries outside of Sudan as soon as possible. Also addressing the conference was former Nigerian head of state, General (Dr.) Yakubu Gowon. General Gowon remarked on the effectiveness of providing safe drinking water to endemic communities in their fight against Guinea worm. Togo's Minister of Health, Professor K. Charles Agba, also thanked the participants for their efforts, but stressed that as the goal of the program is to achieve complete *eradication*, much remains to be accomplished. Finally, the National Program Coordinators reported on the highlights of the campaigns in their respective countries.

The Carter Center emphasizes that an effective surveillance system requires that all data be collected, analyzed, and *acted upon* by appropriate public health programs, with regular feedback to the persons reporting the data. The surveillance system used by the program collects and reports from all known accessible endemic villages monthly. The program reports monthly to the WHO on the number of cases, number of cases contained, and percentage of endemic villages reporting monthly, and conducts regular meetings in the field to review the status of the program indicators. Annually, The Carter Center conducts a program review involving all of the endemic countries and invites WHO, UNICEF and other interested parties to participate in the allocation of resources and technical assistance from year to year.

The indicators are:

- Number and percentage of endemic villages with trained village-based health workers
- Percentage of endemic villages reporting data monthly
- Percentage of endemic villages receiving health education
- Number and percentage of endemic villages with cloth filters (filter coverage)
- Percentage of endemic villages receiving chemical water treatment (Abate)
- Percentage of endemic villages receiving safe water supplies.
- Percentage of endemic villages implementing case containment

2001-02 Anticipated Results

Support from many donors (see list, attached) has leveraged a $15 million grant from the Bill and Melinda Gates Foundation, which will fund eradication outside of Sudan in the next one to two years. Outside of Sudan in 2000, Guinea worm was reduced by 33 percent and the number of endemic villages was reduced by ten percent. Northern Sudan, Ethiopia, Uganda, Mauritania, and Benin are on the verge of breaking transmission and are likely to do so in 2001-02. The program will keep the pressure on, supplying commodities (filters, bicycles and vehicles, Abate) and medical goods, funding, technical assistance in the form of short term consultants, and subgrants to partner NGOs. Nigeria, Ghana, Burkina Faso, Togo, and Niger are the keys to reaching zero cases outside of Sudan. The goal of the global campaign to eradicate Guinea worm is to stop transmission of this disease in all countries outside of Sudan in the next two to three years (see attached *Guinea Worm Wrap Up* #111 and #113 for graphs and tables, also available in color at http://www.cdc.gov/ncidod/dpd/parasites/guineaworm/wrapup/word111.pdf.

Selected Highlights from 2000-2001

irin Aggressive Attack on Guinea Worm Disease in Sudan

NAIROBI 23 May

The Sudan Guinea Worm Pipe Filter Project has begun to distribute nine million filters, one for every man, woman and child at risk of Guinea worm disease in a country that poses "the final great challenge to Guinea worm eradication".... Dr. Rumishael Shoo, the WHO's South Sudan Coordinator, told IRIN on Wednesday that Guinea worm was "a very big problem" in the country, especially in the south, which was by far the largest reservoir in the world, and that tackling it was a real priority. He welcomed the material and resource inputs involved in the Sudan Guinea Worm Pipe Filter Project, while stressing that it was also vital to get all the stakeholders, including local communities, involved in order to ensure that the correct strategies were put in place to eradicate the scourge of the disease.

Overall, all countries outside of Sudan reduced cases by 33 percent in 2000. Less than 21,000 cases now remain outside of Sudan.

- **Sudan** is very close to breaking transmission in the northern states. Nine million pipe filters have been distributed throughout Sudan. The pipe filters are worn around the neck for quick availability and ease of use to filter drinking water from the Guinea worm larvae. The pipe filters were donated with the cooperation the Government of Norway, Norwegian Church Aid, Health and Development International, Hydro Polymers of Norsk Hydro, and the Norwegian Chemical Industry Workers Union and assembled by over 1,300 volunteers in Nairobi (see news clippings, attached).
- **Nigeria** reported 7,869 indigenous cases from 906 villages, of which 201 villages reported only one case each. This is a substantial reduction, the first in five years, and when compared to the 653,492 in 1988, is a major achievement. Guinea worm incidence was reduced 41 percent from the number of cases reported in 1999.
- **Ghana**, the third highest endemic country in Africa, is beginning a massive water investment scheme in order to provide safe drinking water to endemic communities. Six of the ten borehole wells being drilled with Carter Center support in endemic villages of Ghana's Atebubu District have been completed. In 2000, Ghana reduced cases by 18 percent and contained 80 percent of all cases.
- **Uganda** is being helped by UNICEF to get safe water to all endemic villages in Uganda's Kitgum District and expects to complete coverage of endemic villages in Moroto and Kotido Districts in 2001. Uganda reduced cases by 71 percent in 2000 compared to 1999.
- **Ethiopia** drastically reduced its number of reported indigenous cases in 2000 by 78 percent. It has also increased its cash reward for reporting cases.
- **Mauritania** is benefiting from borehole wells provided by the Japan International Cooperation Agency (JICA) in a project that began in 1999. In addition, Global 2000/The Carter Center has sent $25,000 to support surveillance and health education activities. The result in 2000 was a 51 percent reduction in cases.
- **Burkina Faso** mobilized an all-out effort to reactivate the program and is now routinely monitoring copepods to check the efficacy of teams treating water sources. The country is a top priority for UNICEF and deals with other organizations, such as the WHO and Peace Corps. The country contained 68 percent of cases, an improvement from 1999. The Carter Center assigned a resident technical advisor here in April 2001.
- **Niger** reported 1,159 indigenous cases in 2000. The summer of 2000 was very significant due to major mobilization. The Peace Corps has put wells in 15 endemic villages.

Guinea Worm Awards Ceremony
July 18, 2000

Last year, The Carter Center recognized seven countries for their success in halting the transmission of Guinea worm disease with a special ceremony and reception. The event, sponsored by donors John and Rebecca Moores, honored representatives of each country with an award presented by former President Jimmy Carter.

Countries that have reported zero cases of the disease for at least one year include Pakistan, Kenya, India, Senegal, Yemen, Cameroon and Chad. Although endemic countries are certified by the World Health Organization (WHO) as free of transmission only when it can be proven that no cases of the disease have occurred during the three-year period since the last indigenous case occurred, The Carter Center presented these awards to provide encouragement to endemic countries in the interim.

Each country's ambassador received a hand-carved wood and ceramic sculpture, a miniature of one now displayed at The Carter Center. The larger work features a glass base inscribed with a list of all the endemic countries; as each remaining country stops transmission of the disease, the year of eradication will be added to the glass base on the sculpture.

"When The Carter Center first started Guinea worm eradication efforts about 20 years ago, we visited two villages in Ghana that were afflicted with this disease," President Carter told the audience.

"Each village had a population of about 500 people, and two-thirds of those in each community had worms emerging from all over their bodies -- under their arms, between their toes. I saw one woman with 12 worms emerging from different parts of her body," he said.

"The Carter Center initiated its program and one year later, when we returned, there were no cases of Guinea worm in either village. Neither Rosalynn nor I could hide our tears of happiness," he said.

When asked what insight he has gained from this experience, President Carter said, "I learned of the capability and eagerness of the African people to resolve a problem if they are given information about it and assistance to solve it."

President Carter added that he also learned about the generosity of donors -- the lifeblood of the eradication program -- many of whom were present at the awards ceremony.

Donors involved in the ceremony were the governments of Japan, Canada and the United Kingdom; The OPEC Fund for International Development; UNICEF; Evergreen International Aviation and Vestergaard Frandsen Disease Control Textiles. New donors to the Guinea worm program include Johnson & Johnson and the Bill & Melinda Gates Foundation.

"Far removed from the scenes of personal suffering, donors are only connected by human concern," said Dr. Donald Hopkins, associate executive director of the Center's Health Programs, recognizing the importance of their assistance.

Benefits of Guinea Worm Eradication

- **Contribution to Stability**: Progress on the health front, in the context of improved coordination, communication, and cooperation, reinforces political will to support health, clean water, and other basic needs, which in turn promote political stability.
- **Improved Infrastructure:** Since The Carter Center's Global 2000 staff helps the Ministry of Health (MOH) manage the eradication program by providing direct assistance (epidemiological, administrative, logistical, supervisory, communications, fundraising, etc.) according to the ministry's needs, MOH personnel gain experience in managing a successful public health program—experience which has direct and indirect applications to other programs beyond the eradication campaign. In several countries (Ghana, Nigeria, and Yemen), national program coordinators have been promoted to positions with a higher level of authority.

> "The eradication of Guinea worm disease will go far beyond relieving the immediate suffering of afflicted persons. It will strengthen the primary healthcare structures used by the national programs and form the basis for such structures where they do not exist."
>
> –Dr. Donald Hopkins, associate executive director for health programs at The Carter Center

- **Expanded Outreach:** NIGEP enhances outreach because the disease affects the most remote, disenfranchised of rural populations. Nigeria used NIGEP to boost outreach for its EPI program in the southeast. In many instances, villages have been visited and served by health workers for the first time as a result of NIGEP.
- **Strengthened Health Systems:** By using existing primary health care workers or appointing new village-based volunteers, the program creates or strengthens a comprehensive village-based system that can be used for other health care delivery activities during and beyond the eradication campaign. In many cases, technical and financial support provided by The Carter Center has enabled an expansion of limited health services in under-served villages. Services provided have included not only treatment of dracunculiasis, but also basic first aid, immunizations (polio, tetanus and measles), treatment for river blindness, Vitamin A distribution, oral rehydration therapy, and disease surveillance.
- **Integrated Surveillance:** NIGEP has proven the feasibility and effectiveness of village-based surveillance. The system used by the program (trained personnel, including village volunteers, communication network, etc.) produces a long-lasting, reliable feedback mechanism. To take advantage of this infrastructure and minimize the "verticalizing" of health programs, for example, national health programs of endemic countries, in collaboration with WHO and UNICEF, increasingly are using the Guinea worm program's surveillance system to track more than one disease or condition.
- **Improved Water Supply:** NIGEP has worked closely with UNICEF, UNDP, JICA, World Vision, and other rural water supply agencies to target endemic villages, including many in remote regions that normally would not be considered a priority, for water projects. Using data to justify the projects, the program effectively reduced the role politics often plays in deciding which villages receive water. Also, the program helped mobilize communities to build their own wells and stimulated UNICEF to lead an effort to develop guidelines for improving water security. The provision of safe drinking water has resulted in cleaner environments, in which numerous other diseases will be prevented.
- **Enhanced Agricultural Productivity and Nutritional Status:** The significant impact of Guinea worm disease on agricultural productivity was confirmed in a World Bank cost/benefit analysis of

dracunculiasis eradication, which concluded that there was an economic rate of return for eradication of 29 percent, using conservative assumptions about period of disability and impact on agricultural productivity. Once families return to their farms, their first priority is to begin planting, yet the peak transmission season for Guinea worm disease typically coincides with planting and harvesting activities. Families burdened with the disease will be unable to prepare their fields or to reap the harvest. The adverse, indirect nutritional effect on infants of an affected parent has been documented in Sudan. The result of reduced agricultural productivity is reduced food security and reduced nutritional status.

- **Improved Educational Opportunities:** A major reduction in disease reduces the number of school days missed by children. Dracunculiasis is a contributing factor in school dropouts in endemic regions due to repeatedly missed school days. Only after he volunteered to be a regional spokesperson for Guinea worm eradication did General Touré of Mali learn that his own mother had been expelled from school as a child due to the disease.

- **Incentive to Address Other Goals:** The Guinea worm campaign is about empowering individuals, communities, and nations to change their lives and their country for the better. From the highest level of the health structure to the village, the psychological impact of being actively engaged in an effective program with positive results cannot be underestimated. Persons have been transformed from unenergetic pessimists to enthusiastic problem-solvers. They will not stop at Guinea worm.

- **Improvement of Women's Lives:** Often the disease affects women in endemic countries, which then affects entire households because activities such as food preparation, gathering fuel, gathering water for household use, childcare, maintaining household finances, farming, and other activities essential to families and communities are largely the responsibility of women. The observed declines in nutritional levels, household sanitation, and childcare associated with Guinea worm will disappear with the eradication of the disease.

  Since women handle most household tasks, the program relies heavily on women for its success. Locating, transporting, and filtering water for households is primarily the responsibility of girls and women. Therefore, women must be thoroughly familiar with the proper use of cloth filters, and where and how to obtain them. Educating afflicted children on treatment and prevention rests heavily on women who tend to be in closer contact with their children. Women also serve as excellent informants for detecting cases because they frequent the markets and water sources and are generally up to date on social events where they may come across pertinent information. Because of their critical role in fighting dracunculiasis, the program reaches out to them and encourages their full participation.

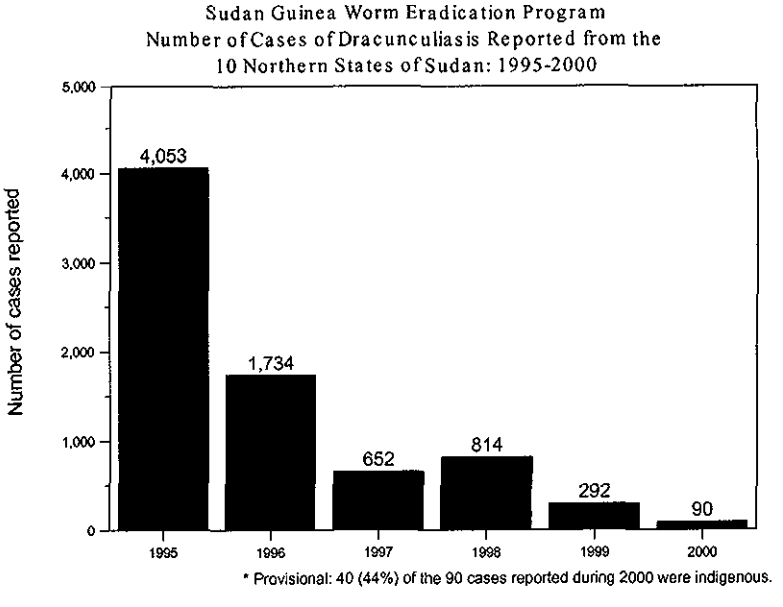
GUINEA WORM ERADICATION PROGRAM
Country Updates 2000 – June 2001

Sudan

- Transmission season is **May-October**
- Sudan reported 54,890 cases in 2000, a 17% reduction from 1999.
- 73% of all reported cases of dracunculiasis in 2000 were from Sudan.
- Of the cases reported, 42% were contained.
- 39% of the accessible endemic villages in Sudan reported regularly. Approximately 2,600 of the 7,898 endemic villages are not accessible to the program due to political strife.
- Sudan exported 16 cases in 2000: two to Central African Republic, six to Ethiopia, four to Kenya, and four to Uganda.Another 456 endemic villages were detected in 2000, 202 of them in active searches associated with National Immunization Days conducted by the polio eradication program. Despite conflict-related constraints, a few southern areas recorded advances against the worm in 2000.
- Part of the Nuba Mountains area became accessible. In early June, four Sudanese health workers visited two endemic localities (Shat Farma and Shat Safiya) in the Nuba Mountains area of South Kordofan State. They found two infected persons, one in each area, and reports that other worms had emerged over the past year. The workers conducted an active case search, held health education sessions, and distributed 1,200 filters. Sudan's Rural Water Corporation and UNICEF drilled three new wells in each of the two areas and rehabilitated another in Shat Farma. Two nurses previously trained in Guinea worm control returned to the areas and will act as village volunteers. There are still suspected endemic areas in the Nuba Mountains that are not accessible.

Northern Sudan in 2000:

In 2000, the 10 northern states of Sudan reported only 41 indigenous cases (of 90 cases reported), a reduction of 77 percent compared to 1999. Another 49 cases were imported by persons displaced to these states from the south. Of the 90 cases reported, 72 (80%) were contained. Ninety percent of the remaining endemic villages now have at least one safe source of drinking water as a result of exemplary collaboration among the SGWEP, UNICEF, and the National Water Corporation. In May, the minister of health of North Kordofan announced a significant reward for the reporting of any indigenously transmitted case.



Southern Sudan in 2000: Progress in the southern states was limited in 2000 because of increased insecurity (more evacuations and bombardments compared to 1999), and withdrawal of international Non-Governmental Organizations (NGOs) from 548 endemic villages because of the dispute over signing a Memorandum of Understanding with the Sudan Relief and Rehabilitation Association (SRRA). Despite these problems, Global 2000 and its partners:

- distributed 678,122 cloth filters to households at risk and134,051 portable pipe filters for personal use (Many of the cloth filters were purchased by some of the over 30 partner NGOs involved in the program);
- carried out 30,000 health education sessions;
- The World Food Program distributed 11.3 metric tons of food with a Tutor's Guide developed by WHO in collaboration with Global 2000 for training sessions that aim to reach each village volunteer twice a year;
- trained over 2,500 village health workers and supervisors; and
- increased distribution and use of temephos, or Abate, throughout the country.

Some southern areas made significant advances. In Wau county of Bahr al-Ghazal state, for example, the NGO *Medicins sans Frontieres (Belgium)* reported a 27 percent reduction in cases, from 644 cases in January - July 1999 to 470 during the same period in 2000. The percentage of endemic villages submitting monthly reports increased from 78 to 94 percent over the same period. In 2000, North Bahr al Ghazal reported a total 1,097 cases, a 62 percent decrease from 2,902 reported in 1999, and Lakes (Buheirat) reported 8,227 cases, a 61 percent decrease from 21,102 in 1999. The reliability of the reported decreases is uncertain, however, because of variable access to the area.

Sudan's Guinea Worm Eradication Program (SGWEP) held its annual Program Review in September in Nairobi, Kenya. More than 50 persons participated in the review, including representatives of the Government of Sudan, the Sudan Relief and Rehabilitation Association (SRRA), the Relief Association of Southern Sudan (RASS), WHO, UNICEF, the Centers for Disease Control and Prevention (CDC), The Carter Center/Global 2000, and over a dozen NGOs. Some of the recommendations were that in 2001, SGWEP should:

- advocate for additional transportation capacity where needed (vehicles, motorcycles, bicycles and animals).
- advocate the possibility of negotiating "safe days" (cease fire) to enable pertinent and life saving interventions, such as the distribution of GWEP supplies and immunizations, to take place in currently inaccessible areas.
- monitor the status of safe water (including the status of hand pumps) in all accessible endemic villages on a monthly basis and report those in disrepair to water sector organizations.
- increase the involvement of local partners such as County Health Departments in program implementation in order to increase local capacity and strengthen sustainability.
- collaborate with the Polio Campaign in an effort to increase health education, supervision and identification of endemic villages.
- strengthen collaboration and establish formal links with the civil society groups active in some highly endemic areas.

2001

Nine million pipe filters have been distributed throughout Sudan (see news clippings, attached). The pipe filters are worn around the neck for quick availability and ease of use to filter drinking water from the Guinea worm larvae. The pipe filters were donated with the cooperation the Government of Norway,

Norwegian Church Aid, Health and Development International, Hydro Polymers of Norsk Hydro, and the Norwegian Chemical Industry Workers Union and assembled by over 1,300 volunteers in Nairobi.

Health Programs Complement Peace Efforts
Since 1999, the Carter Center has been involved in the efforts to resolve the conflict between Sudan and Uganda. In 1999, President Yoweri Museveni of Uganda and President Omar Al Bashir of Sudan issued an invitation to President Carter to assist in finding an end to the long conflict plaguing their two countries. The Carter Center agreed to this request and under the direction of the Conflict Resolution Program (CRP) has put primary emphasis on ending each nation's support of rebel activities within the other's borders. In December of 1999 a summit was convened in Nairobi, Kenya between the two presidents. The resulting Nairobi Agreement, witnessed by President Carter and Kenyan President Daniel arap Moi, committed the two nations to mutual respect for sovereignty and territorial integrity, an end to all hostile rhetoric, the return of all POW's, the return of all abductees, and an end to support for hostile rebel groups operating within each other's country.

Following the historic Nairobi Agreement between Sudan and Uganda in December of 1999, the Conflict Resolution Program has focused its efforts on the specifics of its implementation.

UNESCO awarded the "Uganda 2000 Peace Award" to The Carter Center's Conflict Resolution program for their efforts with the Ugandan government, Acholi elders and religious leaders to build peace in northern Uganda.

Global 2000's Guinea Worm Eradication Program continues to coordinate with the Conflict Resolution Program in order to strategize the most productive ways to work together to promote both peace and health in the southern states of Sudan. Throughout the implementation of the program, both Sudan and Uganda have seen the program as a significant basis for their trust in The Carter Center to act as a neutral party.

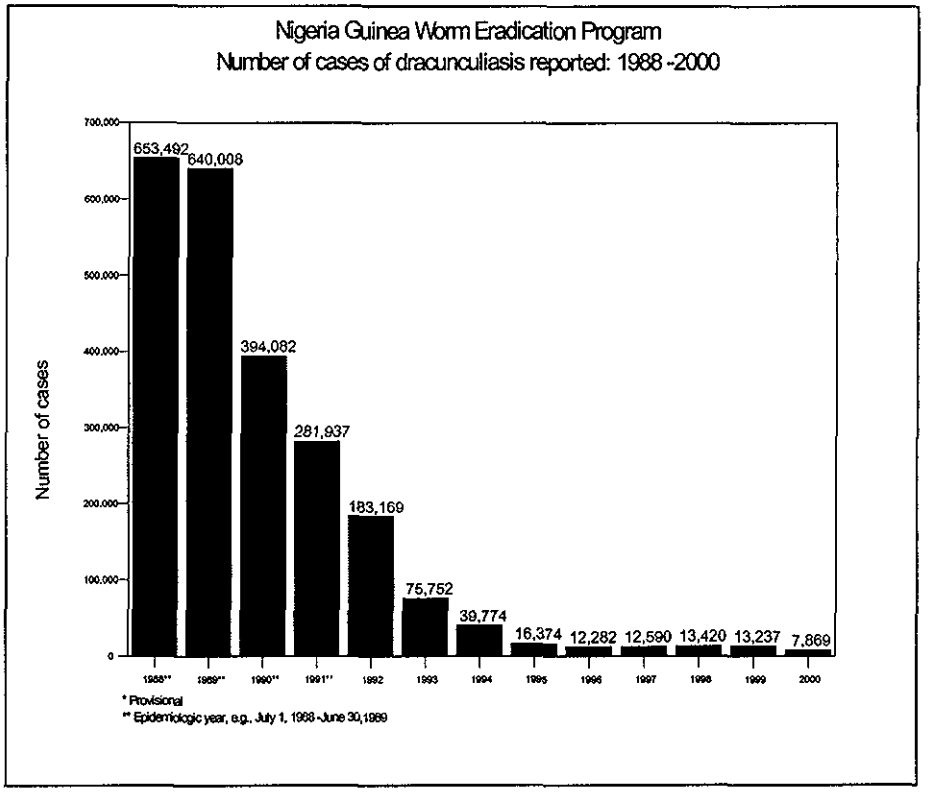
Nigeria

- Peak transmission season in north is **May-August**; in South is **November-February**
- 100 percent of 906 endemic villages had a trained village-based health worker compared to 97 percent in 1999.
- 100 percent of endemic villages reported monthly compared to 97 percent in 1999.
- 100 percent of endemic villages received at least one health education session compared to 97 percent in 1999.
- By the end of 2000, 88 percent of endemic villages had complete filter coverage compared to 27 percent at the end of 1999.
- 54 percent of endemic villages had water source(s) treated with Abate compared to 28 percent in 1999, an increase of 93 percent.
- 50 percent of endemic villages had at least one source of safe drinking water compared to 53 percent in 1999.
- Fifty-eight percent of the cases reported in Nigeria in 2000 were reported as contained 64 percent in 1999.
- Through May 2001, Nigeria reported 2,338 indigenous cases, a reduction of 30 percent compared to the same period of 2000.

Nigeria is the most populous country in Africa and arguably one of the most important countries to the continent's future. If Nigeria can develop, Africa can follow. Therefore, Nigeria is a focus country for

The Carter Center.

When The Carter Center began to assist the Guinea Worm Eradication Program in Nigeria in 1988, it was the most highly endemic country in the world. In the years since, Nigerians reduced their number of Guinea worm cases from 653,492 in 1988 to 7,869 in 2000. Nigeria is now the second most endemic country, after Sudan.



In January 2000, the Steering Committee of NIGEP held its first meeting of the year in Abuja. Representatives of the President, the Federal Ministry of Water Resources, The Carter Center, UNICEF, the World Health Organization (WHO), and the Gowon Center were present. Participants at the meeting hailed the reinvigoration of the Nigerian program as a result of former Nigerian head of state General Yakubu Gowon's efforts. The committee noted several improvements in efforts to bring safe water to endemic communities, and agreed to monitor progress in doing so against the national list of priority endemic villages in future meetings.

In 2000, the program reported 7,869 indigenous cases from 906 villages, of which 201 villages reported only one case each. This is a substantial reduction, the first in five years. Guinea worm incidence was reduced 41 percent from the number of cases reported in 1999. The disease is increasingly concentrated in a few areas. Seven of the country's 36 states and Federal Capital Territory reported 83 percent of the cases in 2000, led by Ebonyi (2,754 cases) and Enugu (1,038) States in the southeastern part of the country. Six states that had reported cases in 1999 reported none in 2000, leaving 19 states still endemic. Only 121 of Nigeria's 778 LGAs remain endemic, while 16 LGAs contain 70 percent of cases.

President Carter attended a successful review of Global 2000 programs in July 2000 and visited Kaduna and Niger states. To maintain the successes of the program, the participants determined that the program needed to continue to improve supervision, surveillance sensitivity, case containment (within 24 hours of worm emergence) and timely implementation of all interventions (health education, household filters, and use of ABATE). The program also will need to continue its strong advocacy campaign to get clean water to endemic villages.

Global 2000 provided consultants to the Southeast and Southwest Zones of Nigeria from January to April 2000, and to the Northeast and Northwest Zones from May to June. Two consultants assisted in the Southeast Zone in September.

General Gowon continued to play an extraordinary role in providing advocacy for Guinea Worm disease eradication during his visits to key endemic states. In early August, Gowon visited Zamfara, Kebbi, and Sokoto States to meet with local leaders. In each state, he inquired about the status of the disease and congratulated leaders who have made substantial accomplishments.

Staff from the Guinea Worm Eradication Programs of Niger and Nigeria held a cross-border meeting in Maradi, Niger on July 26-27, 2001. Guinea worm workers from Kano, Jigawa, and Katsina States, as well as the Local Government Areas bordering Niger, consultants from Northwest and Northeast zones, the desk officer from the Yakubu Gowon Center and the Carter Center country representative attended the meeting on behalf of Nigeria. The participants reviewed recommendations from their previous meeting in Sokoto, and identified specific activities to be implemented on both sides of the shared border, including active case searches, intensification of health education, application of Abate, identification of routes used by nomads, and regular meetings between supervisors located at the borders.

National Guinea Worm Eradication Day was celebrated on March 20, 2001 and included Governor Dr. Sam Ominvi Egwu, former Nigerian Head of State General (Dr.) Yakubu Gowon, Federal Minister of State for Health Dr. (Mrs.) Amina Ndalolo, and members of the Ebonyi State Government and executive council. The Ebonyi State is the most endemic state in Nigeria and accounted for 35% of all cases in 2000.

Ghana

- Peak transmission season is from **November-April**
- Of the 7,400 cases reported in 2000, an 18 percent reduction, 80% were contained.
- 99% of the endemic villages in Ghana reported monthly in 2000.
- Ghana exported 27 cases in 2000: 11 to Benin, six to Cote d'Ivoire, and 10 to Togo. The country imported one case (from Nigeria).
- Ghana reported 3,060 cases through May 2001, a 47% reduction from that period in 2000.

The second bi-annual national review was held in Ho, Volta region in March 2001.

On September 18-20, 2000 the Ghana Guinea Worm Eradication Program (GWEP) convened its annual National Program Review meeting in Tamale, Northern Region, for the first time. Over 75 persons participated in the meeting. Among the recommendations from this year's review were that in 2001, the Ghana GWEP should

- hold monthly meetings at all levels of the program to review the status of interventions.
- give priority to ensuring that all households in all endemic villages are provided with cloth filters before the next peak transmission season.
- convene a similar review in the heart of the remaining endemic areas.
- strengthen active surveillance for dracunculiasis by using National Immunization Days (NIDs) for polio immunization and by extending the Community-Based Surveillance (CBS) system throughout the country
- establish an Interagency Coordinating Committee (ICC) as a forum for exchanging information, planning, and mobilizing resources among relevant agencies and ministries of the government as well as external partners of the program. (The first meeting of this committee was held on November 6 at the Ministry of Health in Accra.)

From October 7-13, the Northern Region Districts held the first Worm Week in Ghana. Participants distributed 3700 cloth filters and demonstrated their proper use and care, painted murals with Guinea worm prevention messages on the outside of school buildings and health facilities, built bridges, piers or docks at dams used for collecting drinking water, and played "Guinea worm games" with members of the communities as a summary of educational presentations and demonstrations that were given during the week.

Northern Region's pioneering drama troupe has performed its Guinea worm skit for over 90,000 persons in 74 endemic communities since November 1999. Atebubu District also formed a drama group consisting of 10 women, and Kete-Krachi District's drama troupe from the Krachi Secondary Technical School performed in several communities.

Some of the different incentives used to reward the work of village volunteers included provision of gum boots in Atebubu District, provision of cutlasses and bicycles in Kete-Krachi District, and provision of free medical care in Nanumba District. Northern Region also began using a new performance appraisal checklist by which supervisors must earn proportions of their monthly allowance in exchange for achieving specific tasks or targets. The two most frequently cited constraints were inadequate transportation and inadequate or delayed funding.

In 2001, Ghana showed that it is feeling the pressure and responding effectively. The head of state, minister of health, deputy director of public health, and the national coordinator are all new, genuinely committed to the effort, and very serious about results. The threat of being overtaken by Nigeria has been a motivating factor.

Burkina Faso

- Of the 1,935 cases reported in 2000-an 11% reduction compared to 1999, 71% were contained.
- Burkina Faso exported 16 cases in 2000: six to Cote d'Ivoire, seven to Mali, and three to Niger. The country imported two cases (both from Mali).
- Burkina Faso reported 146 cases through May 2001, a 51% reduction compared to 2000, indicating improvement in the program.

The impact of a decentralized structure, coupled with a lethargic central administration in the Ministry of Health continues to hurt the program in Burkina Faso. The country has a relatively high percentage of safe drinking water but still has significant Guinea Worm transmission due to broken hand pumps. A meeting of all National Program Managers of all endemic countries was held in Ougadougou, Burkina Faso during March 6-9, 2000 with the hopes that impending review of the host country program, combined with preparations for an international meeting, would stimulate the weak program.

Burkina Faso has become a priority country for UNICEF. Recent support includes two 4-wheel drive vehicles and rehabilitation of wells in endemic villages. More than 20 U.S. Peace Corps Volunteers are posted in some of the most endemic areas, including the highest-endemic district (Kaya), and plan to assist by implementing "Worm Weeks" of intensive community mobilization and health education immediately prior to the peak transmission season.

The Carter Center/Global 2000 has provided three short-term consultants, has purchased 20,000 square meters of nylon filter material and 50 additional bicycles to complement 250 bicycles being provided by

UNICEF, and will provide other support to the national secretariat of the program. The Carter Center also assigned a resident technical advisor to Burkina Faso in April 2001.

The annual Program Review for endemic francophone countries was held in Niamey, Niger on October 23-26, 2000. Recommendations from the review were that in 2001, the Burkina Program should:

- report monthly to WHO and all partners on the status of the program using the form recommended by WHO.
- integrate Guinea worm eradication activities at village-base and de-integrate those at national level.
- advocate with the Ministry of water resources for the provision of safe sources of drinking water in endemic areas.
- create an inter-agency steering committee that includes the Ministry of Health and external partners, and meet monthly to help plan and coordinate program activities.
- develop a complete plan of action for 2001 and prepare to implement all disease control interventions in all endemic villages by January 1, 2001.
- make use of the national youth corps volunteers and other similar resources to identify all villages with endemic transmission of dracunculiasis, which are currently not known to the GWEP.

Niger

- Transmission season is **June-October**
- Of the 1,156 cases reported in 2000—a reduction of 39% compared to 1999—62% were contained.
- 100% of the endemic villages in Niger reported monthly in 2000.
- Niger exported one case in 2000 (to Mali). The country imported 10 cases: three from Burkina Faso, three from Nigeria, and four from Mali.
- Niger reported 12 indigenous cases through June 2001, a 92% reduction compared to the same period in 2000.

Staff from the Guinea Worm Eradication Programs of Niger and Nigeria held a cross-border meeting in Maradi, Niger on July 26-27, 2000. Niger was represented by regional coordinators from Dosso, Tahoua, Maradi, and Zinder, the national coordinator, Ministry of Health staff and the Global 2000 resident technical advisor. The participants reviewed recommendations from their previous meeting in Sokoto, and identified specific activities to be implemented on both sides of the shared border, including active case searches, intensification of health education, application of Abate, identification of routes used by nomads, and regular meetings between supervisors located at the borders.

Global 2000 and the Centers for Disease Control and Prevention supported six technical consultants from May through August to assist in Tahoua, Tera, and Zinder Departments.

The annual Program Review for endemic francophone countries was held in Niamey, Niger on October 23-26, 2000. Recommendations from the review were that in 2001, the Niger GWEP should:

- implement a system of rewards for reporting of cases in all formerly endemic areas.
- implement a surveillance system in nomadic groups in temporary residence within non-endemic villages to avoid the possible reintroduction of dracunculiasis in those villages.
- arrange to make available sufficient numbers of filters to replace those that are damaged before the onset of the transmission period.
- pursue the use of mobile teams in all at-risk areas.

- integrate its activities with those of other national health programs, which also have a vector control component (such as malaria control).
- continue training supervisors in the use and application of Abate.
- initiate operational research in non-endemic villages.
- continue mobilizing people through the use of radio messages, films, or slide shows before the onset of the transmission season.
- target the endemic villages for the provision of safe sources of drinking water.
- reactivate the Guinea worm coordinators in formerly endemic areas so as to benefit from their experience.

First joint Guinea worm eradication-trachoma control Worm Week, Zinder, Niger

During the week of June 4, 2001, thirty teams of American and Japanese volunteers with their Nigerien counterparts lived in 29 of the most Guinea worm-endemic villages in the Mirriah Arrondissement of Zinder, Niger. During Worm Week, each team visited villages and hamlets surrounding their host village, meeting with villagers to gain an understanding of their lives and doing health education activities with them. This year, for the first time, the teams delivered educational messages about trachoma control in addition to Guinea worm eradication. Zinder is the most trachoma-endemic region of Niger, as well as the most Guinea worm-endemic. Volunteers reported that doing both trachoma and Guinea worm activities worked well, giving them a chance to vary and broaden their impact.

The volunteers came from the USA and Japan, with each volunteer teamed with a Nigerien counterpart. There were 19 U.S. Peace Corps volunteers and 11 JOCV volunteers in all. Peace Corps and Global 2000 coordination was done by Peace Corps volunteers Melissa McSwegin and Kelley Sams. Worm Week villages were chosen to cover the sources of 45% of Niger's Guinea worm patients in the year 2000. Seven cantons of Mirriah Arrondissement were involved. A second Worm Week is planned for late-July or early-August in Zinder, which will cover the most endemic villages in the 2001 transmission season, up to that point. At the same time as the Zinder Worm Week was happening, another Worm Week was held in Tera Arrondissement, Tillabery Region, Niger.

Togo

- Transmission season is **September-January.**
- Of the 811 cases reported in 2000, a 49 percent reduction,72% were contained.
- 100% of the endemic villages in Togo reported monthly in 2000.
- Togo exported nine cases in 2000 (all to Benin). The country imported 17 cases: 10 from Ghana, four from Nigeria, and three from Benin.
- Togo reported 339 cases through May 2001, a 14% increase compared to 2000.
- This increase should be mitigated next year as a result of the dedication of ten new borehole wells funded with support from Margo-Grbinich Hunt and Jerry Hunt in nine of the most highly endemic villages.

Health and Development International and Global 2000 provided financial assistance, commodities, and four consultants to Togo from February to August 2000. Global 2000 is helping to provide safe water to 10 priority villages and intensify health education and community mobilization. The program is planning to implement the use of rewards in non-endemic areas. In addition, the Peace Corps has been very active, installing wells in 15 endemic villages.

The Guinea Worm Eradication Program (GWEP) held a "war council" for the last battle against dracunculiasis in Atakpame from August 16-18, 2000. The Prefecture's Secretary General and Director of Health presided along with the national GWEP coordinator. The meeting participants passed a

resolution "Declaration de l'Ogou Pour l'Eradication du ver de Guinee" which calls for the interruption of transmission of Guinea worm disease in Togo by December 31, 2001.

The annual Program Review for endemic francophone countries was held in Niamey, Niger on October 23-26, 2000. Recommendations from the review were that in 2001, the Togo GWEP should:

- obtain regular funding from the government for dracunculiasis eradication.
- involve traditional leaders in all social mobilization activities for dracunculiasis eradication.
- improve the quality of supervision at all levels.
- revise the list of endemic villages annually.
- increase supervisory visits to twice per month by December 2001, as well as treatment of ponds and other activities.
- check the status of filters and replace those damaged as needed during the monthly supervisory and data collection visits to endemic villages.
- redefine and reevaluate the epidemiological situation in each department.
- organize quarterly meetings between the DRS and the DPS and between the supervisors and village volunteers.
- implement the reward system for reporting of cases as soon as possible.
- improve the coverage of endemic areas by village-based health workers.

DECLARATION OF TOGO'S "WAR COUNCIL" FOR GUINEA WORM ERADICATION

We, the participants of this special meeting to mobilize the population for the final battle in the eradication of Guinea worm disease, form the "War Council" organized by the Ministry of Health in collaboration with WHO, Global 2000, UNICEF, and US Peace Corps, which met in Atakpame, Togo during August 16-18, 2000;

Declare guerilla warfare on Guinea worm disease, and re-affirm our unshakeable will to complete its eradication from the District of Ogou by the end of 2001

Launch operation "Guinea worm eradication" and undertake the strategies and tactics shown below:

- Hold a war council in each endemic sub-district as soon as possible under the authority of the District Chief Administrator, (the Préfet) and in coordination with the district medical director;
- Mobilize all villagers, specially those that are young and the women to participate in all aspects of this operation;
- Ensure the protection all sources of drinking water in all endemic villages;
- Rigorously apply the case containment strategy in all villages which report cases;
- Reinforce health education and social mobilization activities, especially inter-personal communications, group discussion and meetings, etc.;
- Undertake the repairs of all permanent water works in all the endemic villages and sensitize the committees which manage the installation of water supply facilities;
- Organize quarterly coordination and monitoring meetings under the co-presidency of the district Chief Administrator (the Préfet) and the DRS, with the participation of the DPPS, the Chief of the DHE regional services and that of the regional chief of health education and community mobilization.

Invite all partners and bilateral and multilateral donor organizations to lend their assistance to make this initiative possible.

Appeal to leaders and spokespersons, politicians, civil servants, the media, religious leaders, national and local authorities, public health and water sector professionals, populations in endemic areas, as well as youth and women movements to lend their solidarity to the implementation of this important operation so it becomes the "final blow" against transmission of the disease in Ogou.

Exhort all local communities in endemic areas to actively participate in efforts to eradicate Guinea worm disease from their communities.

Invite the Minister of Health, the DRS, the Préfet, and all concerned partners to monitor and facilitate all of the decisions of this "War Council" in order to ensure the interruption of transmission of Guinea worm disease in Ogou by 31 December 2001.

Encourage all other endemic districts in Togo to follow in the footsteps of Ogou so that Guinea worm disease is definitively driven out of Togo.

Mali

- Peak transmission season **June-October.**
- Of the 285 cases reported in 2000-a reduction of 29% from 1999-57% were contained.
- 80% of the endemic villages in Mali reported monthly in 2000.
- Mali exported six cases in 2000: four to Niger and two to Burkina Faso. The country imported eight cases: seven from Burkina Faso and one from Niger.
- Mali reported 6 cases through April 2001, a 45% reduction compared to 2000.

The annual Program Review for endemic francophone countries was held in Niamey, Niger on October 23-26, 2000. Recommendations from the review were that in 2001, the Mali GWEP should:

- continue efforts to promote the need for safe sources of drinking water in localities in the North and the implementation of a system to maintain these sources operational.
- strengthen supervision in Tomboctou and Gao beginning in January 2001.
- take advantage of cross-border meetings to harmonize procedures for management of imported cases and to improve the transmission of these data at all levels.
- organize the data collection system to ensure the timely transmission of epidemiological reports to partners.
- intensify the monitoring of all interventions in all endemic localities.

Cote d'Ivoire

- Peak transmission season is **January-May.**
- Of the 285 cases reported in 2000-a 41% reduction from 1999-62% were contained.
- 78% of the 285 cases reported in 2000 were in only 10 villages.
- 100% of the endemic villages in Cote d'Ivoire reported monthly in 2000.
- Cote d'Ivoire exported one case in 2000 (to Burkina Faso). The country imported 12 cases: six from Ghana and six from Burkina Faso.
- Cote d'Ivoire reported 152 cases through May 2001, a 14% reduction compared to 2000.

Health and Development International and Global 2000 continued to provide financial assistance and consultants. While Cote d'Ivoire is experiencing a decline in cases reported, the outbreaks that do occur take place in different locations every year. This may be attributed to the exploitation of the cash reward program by village members, the departure of key Peace Corps volunteers, and political tensions and insecurity. In 2001, MAP International will assist more prominently in the eradication effort. MOH, MAP, UNICEF, and the U.S. Peace Corps formed a national steering committee.

Benin

- Peak transmission season is **October-January.**
- Of the 166 cases reported in 2000-a 65% reduction-81% were contained.
- 95% of the endemic villages in Benin reported monthly in 2000.
- Benin exported three cases in 2000 (all to Togo). The country imported 20 cases: 11 from Ghana and nine from Togo.
- Benin reported 31 cases through May 2001, a 67% decrease compared to 2000.

In 2000, Health and Development International and Global 2000 continued to provide technical assistance to Benin's Guinea Worm Eradication Program (BGWEP), and UNICEF continued to provide support for the provision and rehabilitation of the water supply in Key villages in Zou. Two HDI-supported consultants worked in Zou and Mono Departments in September. Global 2000 provided Abate®, filter material, and financial support for transportation and for a project designed to include more women in the day-to-day village-based Guinea worm eradication activities, particularly surveillance.

The annual Program Review for endemic francophone countries was held in Niamey, Niger on October 23-26, 2000. Recommendations from the review were that in 2001, Benin's GWEP should:

- make efforts to sensitize communities benefiting from the provision of safe sources of drinking water to ensure that they participate in the upkeep and maintenance of these waterworks.
- maintain in reserve a stock of filters sufficient for least 20 villages so it can distribute these immediately to all who need them, should cases be suddenly reported.
- report on the status of interventions by district.
- implement a system of rewards in formerly endemic areas.

Mauritania

- Peak transmission season is from **July-October**.
- Of the 136 cases reported in 2000-a reduction of 51 percent-57% were contained.
- 76 percent of those cases were from only 4 villages.
- 75 percent of villages in 2000 had at least one safe source of drinking water.
- 100% of the endemic villages in Mauritania reported monthly in 2000.
- Mauritania reported 3 cases through May 2001, 2 more than the same period in 2000.

A case search for cases of Guinea worm within Gorgol, Hodh El Gharbi, and Tagant revealed at least 12 new endemic localities (7 in Gorgol and 5 in Hodh El Gharbi) out of 880 visited in 2000. Guinea worm was reported from additional localities visited but these claims are being verified.

Continued challenges to Mauritania's Guinea Worm Eradication Program (MGWEP) included case containment and the assessment of the role of nomadic groups in transmission. However, $25,000 has been sent for surveillance and health education activities.

Guinea Worm Day took place on June 14, 2001 and was very successful, indicating better efforts on the part of the indigenous population towards eradication.

The annual Program Review for endemic francophone countries was held in Niamey, Niger on October 23-26, 2000. Recommendations from the review were that in 2001, Mauritania's GWEP should:

- implement surveillance in non-endemic areas at risk.
- implement a system of rewards for reporting of cases of dracunculiasis.
- institute all of the necessary activities to ensure that 100% of cases of dracunculiasis are contained.
- intensify the use of Abate in the endemic areas.

Uganda

- Peak transmission season is **April-July**.
- Of the 92 cases reported in 2000-a 71% reduction from 1999,76% were contained.
- 100% of the endemic villages in Uganda reported monthly in 2000.
- Uganda imported four cases in 2000, all from Sudan.
- Uganda reported 22 cases through June 2001, a 41% decrease compared to the same period in 2000.

Dr. John Bosco Rwakimari, the National Program Coordinator (NPC) of Uganda's Guinea Worm Eradication Program (GWEP), was awarded the Jimmy and Rosalynn Carter Award for Guinea Worm Eradication for the year 2000. Dr. Donald Hopkins presented the award on behalf of President and Mrs. Carter and The Carter Center following Dr. Rwakimari's presentation at Uganda's Program Review in Nairobi on September 27. Dr. Rwakimari became NPC early in 1998. Despite numerous challenges, Uganda's GWEP reduced dracunculiasis cases by 70% for two consecutive years under Dr. Rwakimari's leadership, from 899 indigenous cases in 1998 to 83 indigenous cases in 2000. Dr. Rwakimari met briefly with Jimmy Carter in Kampala during President Carter's visit to Uganda on June 7, 2001. Dr. Rwakimari said he would like to use the Guinea Worm eradication project as a model for other disease-focused projects, such as AIDS.

The Jimmy and Rosalynn Carter Award was established by President and Mrs. Jimmy Carter for Nigeria and Ghana (then the two highest endemic countries in the world) during the first Program Review for Ghana and Nigeria's GWEPs at The Carter Center in Atlanta in 1991. This is only the second time that a special award has been made to someone outside of those two countries.

The Guinea Worm Eradication Program in Uganda continued to face challenges, including insecurity in the Kitgum District and the importation of cases from Sudan. The primary recommendation at the Program Review was that the program "should try to strengthen coordination with partners along the border with Sudan in an effort to eliminate the spread of Guinea worm disease."

Ethiopia

- Transmission season is **April-July**.
- Of the 54 cases reported in 2000-a 79% reduction from 1999,95% were contained.
- 100% of the endemic villages in Ethiopia reported monthly in 2000.
- Ethiopia imported six cases in 2000, all from Sudan.
- Ethiopia reported 3 cases through June 2001, a 93% reduction compared to the same period in 2000.
- Success may be due to effort to pioneer use of "Guinea worm houses" in South Omo and Gambella in 1999 to isolate cases.

Global 2000 and its partners continued to focus on specific challenges to eradication efforts in Ethiopia, including poor access to Akobo Woreda and case containment in Gambella Region.

After a 95% decrease in indigenous cases reported through May 2001 compared to the same period in 2000, the total number now stands at two. The four other cases in 2001 have come from Sudan, the most endemic country in Africa. The cases were most likely brought by Sudanese war refugees.

Ethiopia's Dracunculiasis Eradication Program (EDEP) held its annual Program Review on September 27, 2000 in Nairobi, Kenya. The recommendations were that EDP should:

- conduct awareness campaigns in non-endemic districts.
- urge its partners to provide safe water to the remaining endemic villages.
- explore the possibility of utilizing guards, (Pond Caretakers) to promote water filtering and prevent contamination at the water source.
- extend surveillance along the border of Sudan and work with NIDs to actively search for unknown endemic villages.
- Hold border meetings with health authorities and other concerned parties in Sudan to discuss cross border issues related to Guinea worm eradication.
- collaborate with the Polio Campaign (NIDs) to conduct active case searches and seek to detect unknown endemic villages.
- develop a plan defining roles and responsibilities for each Partner
- consider increasing and extending its reward to include non-endemic areas and intensifying publicity.
- Continue to help, with Global 2000, UNICEF, and WHO,maintain the eradication of Guinea worm disease on the agenda of the Ministry of Health until there is clearly no indigenous transmission.
- ask the Ethiopian MOH to consider establishing a National Commission to prepare Ethiopia's Country Report that will be submitted to WHO in advance of certification.
- stimulate the MOH to urge all its health units to report all cases of Guinea Worm disease as soon as possible.

Central African Republic

- Central African Republic reported 33 indigenous cases in 2000, a 94% increase from 1999.
- Of the total cases reported, none were contained.
- Central African Republic imported two cases in 2000, both from Sudan.

A two person team from the Centers for Disease Control and Prevention (CDC) visited the Central African Republic (CAR) from July 8-August 4, 2000 at the invitation of CAR's Minister of Health. They assisted in clarifying the status of dracunculiasis in the country, and made recommendations to the national program.

The team visited 29 of 32 villages with recent suspect cases near the southeastern borders with Sudan and Democratic Republic of Congo, as well as the Mboki camp for Sudanese refugees. They interviewed a person who had been filmed earlier in the year with an active case of dracunculiasis, and found other evidence to suggest that there probably is indigenous dracunculiasis in CAR. Through the first half of 2001, no reports of emerging Guinea worms were confirmed but the scars were evident. The seasonal

patterns have been confusing, indicating possible fabrication of Guinea Worm existence in order to get rewards and financial resources.

The team also found widespread confusion between dracunculiasis and onchocerciasis. They obtained worms from just beneath the skin of three suspect cases in three different areas, all of which were found to be Onchocerca upon microscopic examination at CDC.

There is little active surveillance in the suspected endemic areas, and in addition to the confusion with onchocerciasis made it impossible to determine the extent to which dracunculiasis may be under- or over-reported. Among other recommendations, the team suggested that a group of international consultants should return to the CAR during the next peak transmission season.

The annual Program Review for endemic francophone countries was held in Niamey, Niger on October 23-26, 2000. Recommendations from the review were that CAR's GWEP should:

- utilize the National Immunization Days (NIDs) to conduct a survey for cases of dracunculiasis.
- conduct a post-NID survey to verify reports of cases of dracunculiasis.
- implement a credible surveillance system that provides monthly reports of cases of dracunculiasis.
- monitor and evaluate the surveillance system.
- implement a system of rewards for reporting of cases that permits the detection and containment of cases.
- Stimulate the government of CAR to provide financial support for the Guinea Worm Eradication Program.
- Stimulate the government of CAR to encourage water sector organizations to accelerate the provision of safe sources of drinking water.

GWEP Donors

DONORS TARGETING SUPPORT FOR GUINEA WORM ERADICATION EFFORTS IN SUDAN

Clara Caldwell
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PARTNER DONORS INCLUDE THE FEDERAL MINISTRY OF HEALTH, THE WORLD HEALTH ORGANIZATION, AND UNICEF/KHARTOUM (PRIMARILY WATER) AND OTHER NGOS WORKING IN SOUTHERN SUDAN.

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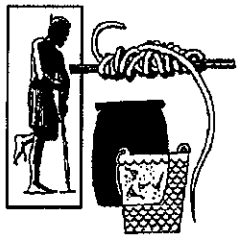
ATTACHMENT

Sudan Pipe Filter Project Press Information



The goal of the Sudan Pipe Filter Project is to significantly reduce the prevalence of Guinea worm disease by increasing people's access to safe water (in terms of protection against Guinea worm disease) through the distribution of portable and reusable Pipe Filters. The effort aims to provide every man, woman, and child at risk for Guinea worm with their own personal Pipe Filter to protect them from contaminated drinking water.

The original "Pipe Filter" was the result of an adaptation to the household nylon filter cloth; nomads would hold a piece of nylon over the end of a reed when drinking from a water source. Today, a group of agencies have implemented a new version of the pipe filter, an intervention referred to as the "Guinea Worm Pipe Filter," currently being distributed in Sudan and several other Guinea worm disease endemic countries. The Pipe Filter is designed for individual use, while the traditional filtering technique utilizes a full size nylon filter cloth for household use. The two intervention strategies are coupled with health education, provision of safe water, treatment of water sources, and community mobilization to reinforce the fight against Guinea worm.

Sudan is the final great challenge to Guinea worm eradication, accounting for 73 percent of all reported cases remaining in the world. In 2000, The Sudan Guinea Worm Eradication Program (SGWEP) reported more than 54,000 new cases of Guinea worm disease from 3,386 villages (actual number of cases in Sudan is unknown). This massive Pipe Filter project has the potential to greatly influence the number of new cases in 2002, bringing the Guinea Worm Program one step closer to complete eradication. Guinea worm is not only a debilitating parasitic disease; it is also a public health and socio-economic issue, impacting household food security, schooling, human dignity, and many other facets of life. Reducing the incidence of Guinea worm disease in Sudan effectively improves the quality of life in Sudan.

The idea to produce and distribute Pipe Filters in Sudan was formulated in response to the epidemiology of disease and the socio-political circumstances in Sudan: the continued conflict and the adverse effects on the population; the number of displaced and nomadic persons; the difficulties of accessing safe drinking water and delivering household filters to every endemic home; filtering water; and the high incidence of Guinea worm disease. Based on figures from the Polio Eradication Programme, the World Food Programme, and the database kept by Global 2000, there are an estimated nine million people in Sudan "at risk for Guinea worm disease."

The continued conflict makes many parts of the country inaccessible, thus the prevalence of disease and the actual number of Guinea worm cases is unknown.

Use of the Pipe Filter prevents the individual from consuming the Guinea worm larvae in the contaminated water, thus interrupting disease transmission. The Pipe Filter consists of a piece of filter nylon material that is held in place by two pieces of PVC (plastic) tubing. String laced through the tubing enables the individual to wear the Pipe Filter around his or her neck. An attached health education illustration demonstrates the correct use of the Pipe Filter. By placing the end of the Pipe Filter with the nylon cloth into the water source, while placing the opposite end in the mouth, water is sucked through the Pipe Filter, similar to a giant straw.

The foundation of the SGWEP was established through a unique web of partners, and such a partnership made the Sudan Pipe Filter Project possible. Hydro Polymers of Norsk Hydro (Norway), Norwegian Church Aid (NCA), Health and Development International (HDI), The Government of Norway, The Federal Ministry of Health (of Sudan), the Sudan Relief and Rehabilitation Association (SRRA), and Global 2000 of The Carter Center have collaborated through 39 implementing agencies (including the Sudan Relief and Rehabilitation Association (SRRA), the Relief Association of South Sudan (RASS), and the Fashoda Relief and Rehabilitation Association (FRRA); 16 working groups, composed of over 1,300 people in Nairobi; and many supporting industries such as Vestergaard Frandsen, Metro Plastics, Meridian Aviation, Artage Communications, Rapid Response, and Golden Renovators; to produce, assemble, and distribute nine million Pipe Filters throughout all of Sudan before the July rains, when peak transmission season begins. An effort of this magnitude would not be possible without the strong collaboration and continued focus of all partners from the community level to the international/global level.

Hydro Polymers, as a producer of PVC piping, has matched donated time from employees in their union to finance this project. Norwegian Church Aid (in Nairobi) has been responsible for formation of the working groups, supervision of these groups, and logistics in assembling and distributing the pipe filters (in Nairobi and Khartoum). NCA has insured success on the ground with the cutters and drillers and the assembly groups and in the many logistical facets of this project. The Government of Norway has made a large financial contribution to the project to support the labor and transport of the Pipe Filters, having been recruited to the Project by NCA. HDI is a donor and active participant in the fight against Guinea worm globally, and the impetus in supporting this project. The Carter Center has made financial contributions and acted as the technical lead on production and assembly of the pipe and the overall distribution to Sudan (in Nairobi and Khartoum).

An effort on this scale requires partnerships focused on the effort to eradicate Guinea worm disease. These partnerships are vital to ensure the success of this project; that every man, woman, and child (at risk for Guinea worm disease) in Sudan receives a Pipe Filter.

Facts:

- Over 1,640 Kilometers of PVC piping purchased by Norsk Hydro; which stretches approximately from Mombassa to Lokichokio;
- 9,000,000 meters of string purchased by HDI;
- 9,000,000 pieces of health education developed and purchased by The Carter Center;
- 9,000,000 pieces of (4.5cm. X 4.5 cm.) nylon monofilament cloth acquired by HDI;
- 256,000 pieces of nylon monofilament donated by Vestergaard Frandsen;
- 16 groups comprised of over 1,300 people assembling the Pipe Filters in and around Nairobi (Kenyan, Ethiopian, and Sudanese) supervised by NCA;
- As of the 22nd of May, over 6.5 million Pipe Filters have been assembled and 5.5 million of these (weighing more than 77 Metric Tons) have been moved to their distribution locations in Sudan;
- The Pipe Filter project started production on the 7th of March; all nine (9) million Pipe Filters will be completed and distributed by the end of July;
- 39 International and indigenous Non-Governmental Organizations, SRRA, RASS, FRRA, and United Nations Programs are working to distribute Pipe Filters in all endemic areas of Sudan.

Carter Center Press Release, May 22, 2001

DISTRIBUTION OF NINE MILLION PIPE FILTERS TO FIGHT GUINEA WORM DISEASE IN SUDAN

The Carter Center, along with its partners - - Health and Development International (HDI), Hydro Polymers of Norsk Hydro, and Norwegian Church Aid (NCA) - - has begun to blanket Sudan with nine million pipe filters - one for every man, woman, and child at risk of Guinea worm disease in Sudan.

"The Sudan Guinea Worm Pipe Filter Project is a positive story coming out of Africa; and unfortunately there are not enough of these," said former President Jimmy Carter. "We are grateful for this opportunity to aggressively attack Guinea worm in Sudan but also encouraged by the eagerness of all interested parties to participate in the fight to eradicate this debilitating disease."

Guinea worm disease cripples victims, leaving them unable to work, attend school, care for children, or harvest crops. Eradicating, or at the very least reducing, the incidence of Guinea worm in a country improves the status of life for all people. The Carter Center leads the global

eradication effort against Guinea worm and has reduced worldwide incidence of the disease by 98 percent, from 3.2 million cases in 1986 to less than 75,000 in 2000. After smallpox, Guinea worm will be the second disease to be eliminated from the world.

Sudan is a great challenge to Guinea worm eradication, accounting for 73 percent of all reported cases. In 2000, The Sudan Guinea Worm Eradication Program (SGWEP) reported more than 54,000 new cases of Guinea worm disease (actual number of cases in Sudan is unknown) from 3,386 villages. The regions with the highest incidence of disease are in the South Sudanese territories - West and South Kordufan States in the Midwest and Southern Blue Nile, White Nile and Sinnar States in Central Sudan. Since November 2000, 10 Northern States have reported zero indigenous cases.

Use of the pipe filter prevents individuals from consuming contaminated water, thus interrupting disease transmission. The original pipe filter was an adaptation to the household nylon filter cloth; nomads would hold a piece of nylon over the end of a reed, like a straw, to drink. Today, a new version of the pipe filter is being distributed in Sudan and several other endemic Guinea worm countries.

The idea to produce and distribute pipe filters in Sudan was formulated in response to the epidemiology of the disease and the socio-political circumstances in Sudan: the continued conflict and the adverse effects on the population; the number of displaced and nomadic persons; the difficulties of accessing safe drinking water and delivering household filters to every endemic home; and the high resultant incidence of Guinea worm disease.

"An effort of this magnitude would not be possible without the strong collaboration and continued support of our partners from the community to the international level," said Dr. Donald Hopkins, associate executive director of The Carter Center's Health Programs.

The SGWEP was established through a unique collaboration, which also made the Sudan Pipe Filter Project possible. HDI, NCA, Hydro Polymers, and The Carter Center have joined forces with over 39 implementing agencies; 16 working groups, composed of over 1,300 people in Nairobi; and many supporting industries such as Vestergaard Frandsen, Metro Plastics, Meridian Aviation, Artage Communications, Rapid Response, and Golden Renovators. Together these groups are working to produce, assemble, and distribute nine million pipe filters throughout Sudan before the July rains when peak transmission season begins. More than six million pipe filters have been produced, 5.5 million of those have been distributed in the most endemic areas of Sudan for Guinea worm disease.

"The massive pipe filter project has the potential to greatly influence the number of new cases in Sudan in 2002. However, we must remain aware that it is the continued conflict that leaves many parts of the country inaccessible or difficult to reach, making the prevalence of disease and the actual number of Guinea worm cases unknown," said Dr. Hopkins.

"We feel that the Pipe Filter project is the quickest and most effective solution at this time to eradicate Guinea worm disease in Sudan, given the constraints of the environment and the cost's associated with providing clean water. This solution gives the Sudanese people a better quality of life without Guinea worm disease," said Mr. Mikkel H. Storm, public affairs manager, Hydro Polymers, after his visit to Sudan.

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The Atlanta Journal-Constitution
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INTERNATIONAL ATLANTA: Filters target health crisis in Sudan

Carter Center aids prevention of Guinea worm
Don Melvin - Staff
Thursday, May 24, 2001

Disease and war are frequent companions. So it is no surprise that the global effort to eradicate Guinea worm, a parasitic disease that has crippled people since the time of the Bible, is running into the most difficulty in Sudan, a country that has been battered by war for nearly 20 years.

But now the Carter Center is participating in an effort to protect the Sudanese from the ancient scourge, even if war drives them from their homes and scatters their families. The center hopes to outfit every person in the areas where the disease exists --- predominantly the southern part of the country --- with a personal prevention plan that he or she can wear around the neck, even on the run.

If Guinea worm is eradicated, the WHO says, it will become only the second disease ever, after smallpox, to be wiped from the face of the Earth. It is a project the Carter Center has been working on for 15 years.

"I think Guinea worm affects every aspect of the Sudanese civilians' life, from the agricultural practices to the capacity to earn income and raise livestock," said Bruce Brown, an employee of the Centers for Disease Control and Prevention who is on loan to the Carter Center. "This disease is so debilitating that it really limits the capacity of the individual to operate in every sector of society."

Guinea worm has been eradicated in Asia, but it still exists in 13 African countries. And the majority of the cases in the world can now be found in just one country --- sprawling, war-torn Sudan.

The disease usually affects the poorest people, those who live in remote villages. They contract it by drinking stagnant water contaminated with tiny fleas that carry Guinea worm larvae.

Inside the human body, the larvae mature, growing as long as 3 feet. After a year, the threadlike worm emerges through a blister in the skin. If the worm breaks, infection can result, so extracting it can take months. Day by day, the victims gradually, carefully, wind the fragile worm a little bit more around a slender stick.

But Guinea worm is easily preventable.

Water filtered through tightly woven nylon cloth contains no larvae and is safe to drink. For years, the Carter Center and other organizations have distributed filters. Usually about 2 feet in diameter, the filters are meant to fit over the top of water containers. They have been handed out, one to a family.

But in Sudan, a country riven by ethnic and religious conflict, warring armies regularly drive large numbers of people from their homes. Under those circumstances, one filter per family no longer provides protection for everyone.

Now the Carter Center, together with a Scandinavian nongovernmental organization called Norwegian Church Aid, is working to distribute 9 million "pipe filters" to people in Sudan.

The devices are amazingly simple. They are made from two pieces of PVC pipe --- a short piece large enough to fit snugly over a smaller, longer piece and hold a cloth filter in place. The device is slung on a loop of string so that it can be hung from a person's neck.

It amounts to a large straw with a filter in it. As pictorial directions attached to the string illustrate, a person stopping to drink from a pond should suck the water up through the filter to avoid getting Guinea worm.

Many Sudanese, who used to harbor all manner of suppositions about the cause of the disease, have come to understand how to avoid it.

"This is actually a desired item," Brown said of the filter. "People ask for it."

Brown returned to Atlanta early this month from Kenya, where he was supervising the assembly and distribution of the filters. The filters are assembled in Nairobi by about 1,200 people, who are generally in desperate need of money.

Each worker is paid 0.75 shillings for each filter he or she assembles, Brown said. Some workers assemble 800 filters a day, earning 600 shillings, or about $8. This is a significant income in a country where, Brown said, day laborers commonly earn a third of that amount or less.

"It's putting food on the table," Brown said.

In the areas of Sudan that are controlled by rebels, the filters are distributed by 35 relief and development agencies. The government of Sudan is distributing the filters in the areas it controls.

The project is costing about $1 million, of which the Carter Center, which is leading the assembly and distribution effort, is contributing $200,000, said Emily Howard, a spokeswoman for the center. The governments of Norway and Japan have also contributed, as have various companies and nongovernmental agencies, she said.

So far, 5.5 million filters have been distributed. The Carter Center hopes to hand out all 9 million filters before the rains begin in June, making much of southern Sudan inaccessible and the risk of catching Guinea worm disease greater.

Similar articles appeared May 24 in:
Africa News, "Aggressive Attack On Guinea Worm Disease."
Al Ayaam, "Norwegian Support For Guinea Worm Eradication Programme."
Panafrican News Agency, "Sudan Gets Millions of Filters to Fight Guinea Worm Infection."
BBC Worldwide Monitoring, "Norway assists national campaign to eradicate guinea worm disease."
UN Information Center in Sudan, "Sudan Gets Millions of Filters to Fight Guinea Worm Infections"

Photo of a Pipe Filter